

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 June 2004 (24.06.2004)

PCT

(10) International Publication Number
WO 2004/053989 A2

(51) International Patent Classification⁷: H01L 27/02, 29/70 [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(21) International Application Number: PCT/IB2003/005860 (72) Inventors; and

(22) International Filing Date: 8 December 2003 (08.12.2003) (75) Inventors/Applicants (for US only): NAETHE, Axel [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weiss hausstr. 2, 52066 Aachen (DE). KORDTS, Juergen [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weiss hausstr. 2, 52066 Aachen (DE). BEIER, Ralf [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weiss hausstr. 2, 52066 Aachen (DE).

(25) Filing Language: English

(26) Publication Language: English

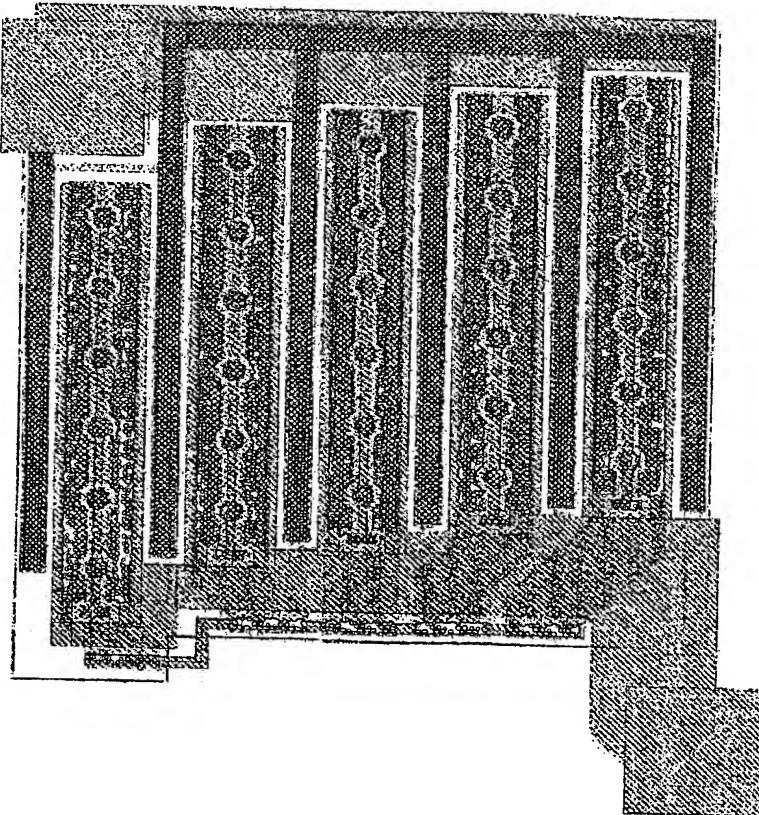
(30) Priority Data: 02102731.3 11 December 2002 (11.12.2002) EP (74) Agent: VOLMER, Georg; Philips Intellectual Property & Standards GmbH, Weiss hausstr. 2, 52066 Aachen (DE).

(71) Applicant (for DE only): PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH [DE/DE]; Stein-damm 94, 20099 Hamburg (DE).

(71) Applicant (for all designated States except DE, US): KONINKLIJKE PHILIPS ELECTRONICS N.V. (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,

[Continued on next page]

(54) Title: SEMICONDUCTOR COMPONENT WITH A BIPOLAR LATERAL POWER TRANSISTOR



(57) Abstract: A semiconductor component comprising at least one lateral bipolar power transistor which is composed of at least one group of single transistors with a common collector-, base- and emitter zone, which are parallel connected by three conductor track systems which bring together the emitter-, base- and collector currents of each of the single transistors; and each single transistor comprises an emitter region having an emitter-contact zone with an emitter contact, at least one active emitter zone and a connection zone between the contact zone and the active zone, a base region having a base-contact zone with a base contact and an internal base series resistor, and a collector region, said internal base series resistor being a structured semiconductor region comprising at least two ring segments, which is connected to the base contact zone and to the base contact.



SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States (regional):** ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 03/05860

A. CLASSIFICATION OF SUBJECT MATTER					
IPC 7	H01L27/01	H01L29/70	H01L29/73	H01L29/735	H01L29/423
	H01L29/06	H01L29/10	H01L29/08	H01L27/07	

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 157 561 A (IWASAWA SHIGEO ET AL) 5 June 1979 (1979-06-05) column 4, line 6 - column 5, line 8; figures 2a,2b column 6, line 26 - line 39; figures 5a,5b.	1-4
X	PATENT ABSTRACTS OF JAPAN vol. 0020, no. 90 (E-045), 22 July 1978 (1978-07-22) -& JP 53 054977 A (HITACHI LTD), 18 May 1978 (1978-05-18) abstract figures 1,2,4,5	1-4
A	DE 30 35 462 A (SIEMENS AG) 13 May 1982 (1982-05-13) cited in the application the whole document	1-4

Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

- *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the International search

26 July 2004

Date of mailing of the International search report

02/08/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lantier, R

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 03/05860

Patent document(s) cited in search report		Publication date		Patent family member(s)	Publication date
US 4157561	A	05-06-1979	JP	1145163 C	12-05-1983
			JP	53053979 A	16-05-1978
			JP	57024033 B	21-05-1982
JP 53054977	A	18-05-1978	NONE		
DE 3035462	A	13-05-1982	DE	3035462 A1	13-05-1982
			DE	3175383 D1	30-10-1986
			DE	3177128 D1	04-01-1990
			EP	0048358 A2	31-03-1982
			EP	0172327 A2	26-02-1986
			JP	1032668 B	10-07-1989
			JP	1550835 C	23-03-1990
			JP	57084172 A	26-05-1982
			JP	1680514 C	13-07-1992
			JP	3032216 B	10-05-1991
			JP	60167368 A	30-08-1985
			US	4511912 A	16-04-1985
			US	4686557 A	11-08-1987